

# SEQUENCE LISTING

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<120> IDENTIFICATION OF THE DOMAIN OF  
 PLASMODIUM FALCIPARUM ERYTHROCYTE MEMBRANE PROTEIN 1  
 (PFEMP1) THAT MEDIATES ADHESION TO CHONDROITIN SULFATE A

<130> NIH176.001C1

<150> PCT/US00/24195

<151> 2000-09-01

<150> 60/152,023

<151> 1999-09-01

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<170> FastSEQ for Windows Version 4.0

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 Asp Phe Lys Asp Asn Leu Cys Arg Ile Met Ile Lys His Ser Asn Arg  
 805                      810                      815  
 Asn Leu Gly Phe Ser Asn Gly Pro Cys Asp Gly Lys Gly Thr Gly Asp  
 820                      825                      830  
 Gly Ile Gln Thr Arg Phe Val Val Gly Thr Glu Trp Glu Val Asp Pro  
 835                      840                      845

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Glu His Met Arg Lys Asp His Glu Asp Val Ile Met Pro Pro Arg Arg  
 850 855 860  
 Arg His Ile Cys Thr Ser Asn Leu Glu His Leu Gln Thr Asp Asp His  
 865 870 875 880  
 Pro Leu Asn Gly Asn Ile Val Asp Asp Leu Val Asn Asn Ser Phe Leu  
 885 890 895  
 Gly Asp Val Leu Leu Ser Ala Lys Tyr Glu Ala Asn Lys Ile Ile Arg  
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 Met Tyr Lys Glu Lys Asn Asn Leu Lys Gly Pro Lys Glu Val Thr Asp  
 915 920 925  
 Pro Lys His Gln Thr Thr Ile Cys Arg Ala Ile Arg Tyr Ser Phe Ala  
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 Asp Ile Gly Asp Ile Ile Arg Gly Arg Asp Leu Trp Glu Arg Asn Gly  
 945 950 955 960  
 Asp Met Val Lys Leu Gln Gly His Leu Glu Thr Val Phe Gly Asn Ile  
 965 970 975  
 His Lys Ser Leu Lys Gly Lys Gly Asn Asp Lys Tyr Asn Asp Asp Ala  
 980 985 990  
 Pro Lys Tyr Leu Lys Leu Arg Glu Asn Trp Trp Glu Ala Asn Arg Ala  
 995 1000 1005  
 Lys Val Trp Glu Ala Met Lys Cys Asp Ile Lys Tyr Leu Lys Asp Lys  
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 Ser Gly His Gln Ser Thr Gln Ser Ser Tyr Cys Gly Tyr Ser Asp His  
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 Thr Pro Leu Asp Asp Tyr Ile Pro Gln Lys Leu Arg Trp Met Thr Glu  
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 Trp Ala Glu Trp Tyr Cys Lys Val Gln Lys Lys Glu Tyr Asp Lys Leu  
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 Thr Lys Glu Ser Gly Thr Gly Cys Thr Lys Cys Thr Glu Ala Cys Asn  
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 Glu Tyr Asn Asp Ile Ile Gly Leu Trp Lys Glu Gln Trp Asn Ile Ile  
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 1125 1130 1135  
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 1140 1145 1150  
 Asn Val Ile Glu Phe Leu Ser Glu Leu Tyr Gln Gln Asn Gly Gly Lys  
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 1170 1175 1180  
 Thr Thr Tyr Glu Asn Val Gly Ala Tyr Leu His Asp Thr Gly Asn Phe  
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 Asp Asp Cys Gln Ser Gln Asn Glu Phe Cys Asp Glu Lys Ser Asp Gly  
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 Lys Asp Asn Glu Lys Tyr Ala Phe Arg Asp Lys Pro Gln Asp His Asp  
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 Gly Ala Cys Gly Cys Lys Ser Gly Ser Lys Pro Thr Arg Val Gln Ile  
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 Lys Thr Lys Lys Lys Ala Glu Glu Lys Asp Thr Glu Cys Lys Thr Val  
 1250 1255 1260  
 Asn Asp Ile Leu Lys Glu Asn Asp Gly Lys Lys Gln Val Glu Asp Cys  
 1265 1270 1275 1280  
 His Pro Lys Lys Asn Ser Asn Gly Tyr Pro Asp Trp Gln Cys Gly Asn

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Ile Asn Leu Val Glu Asp Pro Arg Val Cys Met Pro Pro Arg Arg Gln		
1300	1305	1310
Lys Leu Cys Val His Phe Leu Ala Asn Asp Asn Glu Ile Lys Lys Leu		
1315	1320	1325
Gln Ser Gln Val Asn Leu Lys Glu Ala Phe Ile Lys Ser Ala Ala Ala		
1330	1335	1340
Glu Thr Phe Phe Ser Trp Tyr Tyr Tyr Lys Ser Lys Asp Gly Glu Gly		
1345	1350	1355
Asn Glu Leu Asp Lys Glu Leu Lys Glu Gly Lys Ile Pro Pro Ala Phe		
1365	1370	1375
Leu Arg Ser Met Phe Tyr Thr Phe Gly Asp Tyr Arg Asp Phe Leu Phe		
1380	1385	1390
Gly Thr Asp Ile Ser Lys Gly His Gly Glu Gly Ser Lys Leu Lys Glu		
1395	1400	1405
Gln Ile Asp Ser Leu Phe Lys Asn Gly Asp Gln Lys Ser Pro Asn Gly		
1410	1415	1420
Lys Thr Arg Gln Glu Trp Trp Thr Glu His Ser His Glu Ile Trp Glu		
1425	1430	1435
Ala Met Leu Cys Ala Leu Val Lys Ile Gly Ala Lys Lys Asp Asp Phe		
1445	1450	1455
Thr Glu Asn Tyr Gly Tyr Asn Asn Val Lys Phe Ser Asp Lys Ser Thr		
1460	1465	1470
Thr Leu Glu Glu Phe Ala Lys Arg Pro Gln Phe Leu Arg Trp Leu Thr		
1475	1480	1485
Glu Trp Tyr Asp Asp Tyr Cys Tyr Thr Arg Gln Lys Tyr Leu Lys Asp		
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Val Gln Glu Lys Cys Lys Ser Asn Asp Gln Leu Lys Cys Asp Thr Glu		
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Cys Asn Lys Lys Cys Glu Asp Tyr Val Lys Tyr Met Lys Lys Lys Lys		
1525	1530	1535
Glu Trp Ile Pro Gln Asp Lys Tyr Tyr Lys Asp Glu Arg Asp Lys Lys		
1540	1545	1550
Arg Phe Asp Arg Gln His Ile Gly Val Met Val Thr Asp Tyr Thr Gly		
1555	1560	1565
Thr Asn Ala Thr Asp Tyr Leu Asn Arg Lys Phe Thr Ala Ser Cys Gly		
1570	1575	1580
Asp Lys Pro Gly Ser Ala Ser Val Val Gln Arg Asn Ile Gln Leu Leu		
1585	1590	1595
Glu Lys Gln Ala Tyr Tyr Asp Ala Asp Lys His Cys Gly Cys Thr Lys		
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Phe Ile Glu Asn Asp Asp Lys Tyr Thr Asn Ile Ser Ser Lys Asp Lys		
1620	1625	1630
Cys Lys Gly Leu Val Lys Glu Ala Asn Thr Gly Ala Ile Lys Trp Gln		
1635	1640	1645
Asn Lys Gly Pro Asn Asn Tyr Asn Asn Leu Lys Glu Leu Thr Glu Asp		
1650	1655	1660
Val Leu Phe Pro Ser Arg Arg Leu Arg Ile Cys Phe His Ala Leu Asp		
1665	1670	1675
Gly Asn Tyr Thr Asp Pro Glu Val Lys Asp Glu Asn Gly Leu Arg Lys		
1685	1690	1695
Arg Leu Met Glu Val Ala Ala Thr Glu Gly Tyr Asn Leu Gly Gln Tyr		
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Tyr Lys Glu Lys Lys Glu Lys Glu Lys Ile Lys Thr Ser Asp Ala His		
1715	1720	1725



Lys Tyr Ser Tyr Glu Val Pro Pro Cys Ser Ala Met Lys Tyr Ser Phe  
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 Tyr Asp Leu Arg Asp Ile Ile Leu Gly Ile Asp Asn Leu Glu Asp Glu  
 1745 1750 1755 1760  
 Lys Gln Lys Thr Glu Glu Asn Leu Lys Lys Ile Phe Asn Lys Asn Gly  
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 Thr Ser Val Gly Lys Gly Ser Asp Ser Thr Thr Gly Asn Pro Gly Ser  
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 Thr Ala Arg Lys Phe Phe Trp Asn Glu Asn Lys Glu Cys Val Trp Asn  
 1795 1800 1805  
 Ala Met Ile Cys Gly Tyr Lys Arg Gly Arg Asp Asp Gly Asn Ser Gly  
 1810 1815 1820  
 Asn Ser Ala Arg Ser Asp Glu Asp Leu Lys Lys Cys Gly Ser Val Pro  
 1825 1830 1835 1840  
 Ser Asp Asp Asp Tyr Pro Met Gly Lys Asn Arg Asp Glu Gly Thr Ala  
 1845 1850 1855  
 Tyr Gln Phe Leu Arg Trp Phe Ala Glu Trp Gly Glu Asp Phe Cys Lys  
 1860 1865 1870  
 His Lys Glu Lys Glu Leu Glu Lys Leu Val Gly Ala Cys Asn Asp Tyr  
 1875 1880 1885  
 Thr Cys Gly Asp Asn Glu Asp Lys Arg Lys Lys Cys Thr Asp Ala Cys  
 1890 1895 1900  
 Thr Gln Tyr Lys Lys Phe Ile Ser Glu Trp Lys Pro Gln Tyr Glu Lys  
 1905 1910 1915 1920  
 Gln Ile Lys Lys Tyr Gly Glu Asn Lys Asp Lys Ile Tyr Ser Glu His  
 1925 1930 1935  
 Pro Val Ala Lys Asp Ala Glu Asp Ala Arg Glu Tyr Leu Asp Lys Gln  
 1940 1945 1950  
 Leu Lys Lys Ile Cys Glu Asn Lys Ser Gly Asp Cys Glu Tyr Lys Cys  
 1955 1960 1965  
 Met Lys Asp Val Ser Thr Gln Arg Leu Thr Asp Gly Asn Ser Gln Asn  
 1970 1975 1980  
 Met Pro Ala Ser Leu Asp Asp Glu Pro Lys Glu Val Glu Gly Lys Cys  
 1985 1990 1995 2000  
 Asn Cys Gln Val Pro Arg Gly Pro Pro Arg Val Arg Arg Glu Thr Pro  
 2005 2010 2015  
 Ser Pro Arg Val Ser Leu Ile Ser Lys Ala Thr Ala Ser Lys Lys Glu  
 2020 2025 2030  
 Ala Lys Thr Ala Pro Pro Thr Lys Gln Pro Lys Lys Val Glu Asn Leu  
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 Thr Thr Glu Met Arg Ala Gln Thr Arg Thr Arg Arg Ala Ala Gln Gln  
 2050 2055 2060  
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 2065 2070 2075 2080  
 Thr Met Val Lys Ala Ile Leu Ser Asn Lys Pro Asp Ser Arg Gly Gly  
 2085 2090 2095  
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 Cys Ile Val Gly Lys Ser Lys Glu Asn Glu Asn Gly Ile Cys Met Pro  
 2115 2120 2125  
 Pro Arg Arg Lys Lys Leu Cys Ile Asn Asn Ile Gln Tyr Leu Asn Tyr  
 2130 2135 2140  
 Glu Thr Glu Asn Lys Arg Asp Asn Asp Ile Lys Glu Ala Phe Ile Lys  
 2145 2150 2155 2160  
 Cys Ala Ala Ile Glu Thr Gln Phe Leu Trp Leu Lys Tyr Ile Ile Glu

2165	2170	2175
Asn Pro Ala Ala Glu Asn Glu Leu Gln Asn Gly Thr Ile Pro Asp Glu		
2180	2185	2190
Phe Lys Arg Ile Met Tyr Tyr Thr Tyr Gly Asp Tyr Lys Asp Met Phe		
2195	2200	2205
Phe Gly Thr Asp Ile Ser Asn Asp Lys Lys Ile Ile Thr Val Thr Asn		
2210	2215	2220
Ser Val Thr Thr Ile Leu Asn Glu Asn Asn Lys Lys Lys Gln Asp Lys		
2225	2230	2235
Lys Lys Asp Glu Glu Leu Arg Lys Ile Phe Trp Glu Lys Asn Lys Lys		
2245	2250	2255
Phe Ile Trp Glu Gly Met Ile Tyr Gly Leu Thr Tyr His Leu Thr Asp		
2260	2265	2270
Glu Asn Glu Lys Glu Lys Ile Arg Asp Asn Tyr Gln Tyr Asn Asp Met		
2275	2280	2285
Thr Lys Leu Thr Pro Ser Leu Glu Glu Phe Val Lys Arg Pro Gln Phe		
2290	2295	2300
Leu Arg Trp Phe Thr Glu Trp Ala Glu Glu Phe Cys Asn Lys Arg Lys		
2305	2310	2315
Glu Gln Leu Leu Lys Leu Glu Ala Gly Cys Lys Glu Tyr Glu Cys Asn		
2325	2330	2335
Gly Ser Asn Asp Gly Lys Thr Gln Glu Cys Ala Glu Ala Cys Val Thr		
2340	2345	2350
Tyr Gln Asn Phe Ile Lys Lys Trp Lys Thr Glu Tyr Glu Arg Gln Arg		
2355	2360	2365
Glu Lys Phe Lys Lys Asp Lys Asp Gly Lys Lys Tyr Lys Asp Tyr Pro		
2370	2375	2380
Ser Thr Glu Arg Asp Ile Glu Lys Ala Thr Cys Ala His Glu Tyr Leu		
2385	2390	2395
Asn Met Lys Leu Lys Glu Leu Cys Gly Asn Lys Asp Cys Ser Cys Met		
2405	2410	2415
Gln Lys Pro Ser Ser Gln Leu Pro Lys Thr Thr Gln Gln Ser Gln Ser		
2420	2425	2430
Ser Asp Ala Asn Asp Met Pro Glu Ser Leu Asp Tyr Val Pro Glu Glu		
2435	2440	2445
Phe Asn Lys Cys Glu Cys Pro Glu Leu Ser Lys Lys Gly Ser Met Ile		
2450	2455	2460
His Thr Lys Lys Ile Thr Glu Pro Lys Ile Pro Met Asn Cys Val Glu		
2465	2470	2475
Lys Ala Ala Tyr Tyr Leu Ser Lys Glu Ala Glu Asn Asn Met Asp Ile		
2485	2490	2495
Thr Leu Lys Glu Lys Phe Ile Pro Ile Glu Ser Thr Lys Glu Lys Glu		
2500	2505	2510
Ser Lys Asn Ser Trp Thr Asn Asn Asn Pro Cys Asp Pro Lys Lys Pro		
2515	2520	2525
Tyr Ala Pro Asp Lys Tyr Ile Gly Arg Arg Asn Pro Cys Glu Asn Arg		
2530	2535	2540
Glu Glu Asn Arg Phe Lys Val Asp Tyr Glu Trp Lys Cys Tyr Lys Asn		
2545	2550	2555
Ser Lys Phe Tyr Gln Glu Lys Lys Arg Val Cys Val Pro Pro Arg Arg		
2565	2570	2575
Glu His Met Cys Leu Arg Asn Leu Asp Glu Ile Lys Ile Glu Arg Leu		
2580	2585	2590
Lys Asp Ser Asn Tyr Leu Leu Lys Met Val Arg Arg Thr Ala Arg Asn		
2595	2600	2605

Glu Gly Ile Asp Ile Ile Lys Asn Phe Asn Ser Glu Asn Gly Cys Ala  
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 Met Asn Pro Ile Cys Asp Thr Met Lys Tyr Ser Phe Ala Asp Leu Gly  
 2625 2630 2635 2640  
 Asp Ile Val Arg Gly Thr Asp Met Leu Arg Ile Gly Gly Tyr Leu Pro  
 2645 2650 2655  
 Pro Val Glu Ile Lys Leu Tyr Lys Val Phe Glu Tyr Ile Tyr Gly Lys  
 2660 2665 2670  
 Trp Arg Asn Lys Asn Lys Gly Arg Asn Lys Tyr Asn Asp Val Gln Thr  
 2675 2680 2685  
 Phe Arg Ser Ala Trp Trp Asp Ala Asn Arg Lys Asp Ile Trp Lys Ala  
 2690 2695 2700  
 Met Thr Cys Lys Ala Pro Glu Asp Ala Lys Leu Phe Arg Lys Gly Arg  
 2705 2710 2715 2720  
 Met Asp Gly Phe Glu Arg Ile Thr Leu Ile Gln Asp Lys Cys Gly His  
 2725 2730 2735  
 Lys Asp Asp Pro Pro Val Asp Asp Tyr Ile Pro Gln Arg Phe Arg Trp  
 2740 2745 2750  
 Met Thr Glu Trp Ser Glu Tyr Tyr Cys Lys Ala Leu Met Glu Glu Leu  
 2755 2760 2765  
 Glu Lys Phe Lys Lys Ser Cys Asp His Cys Lys Thr Ser Asp Arg Cys  
 2770 2775 2780  
 Lys Asn Asp Tyr Asp Glu Asn Lys Cys Glu Gln Cys Lys Thr Arg Cys  
 2785 2790 2795 2800  
 Gln Glu Tyr Lys Asn Phe Val Leu Lys Trp Lys Ser Leu Phe Asp Ile  
 2805 2810 2815  
 Gln Ser Asn Lys Tyr Lys Glu Leu Tyr Glu Gln Pro Ile Tyr Thr Lys  
 2820 2825 2830  
 Ile Ser Thr Tyr Asp His Val Gln Asn Phe Val Gln Lys Leu Lys Thr  
 2835 2840 2845  
 Phe Lys Ser Glu Cys Ser Val Glu Ser Phe Ser Glu Tyr Leu His Glu  
 2850 2855 2860  
 Thr Ser Lys Cys Leu Asn Tyr Lys Phe Asn Glu Asn Asp Gly Ser Ser  
 2865 2870 2875 2880  
 Asn Ile Arg Thr Tyr Ala Phe Glu Glu Thr Pro Lys Ser Tyr Lys Glu  
 2885 2890 2895  
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 Thr Asp Gln Asn Lys Asp Gly Cys Lys Glu Leu Gln Thr Phe Thr Phe  
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 Cys Ser Lys Asn Asp Tyr Asp Asn Asn Leu Asp Asn Trp Asn Ala Tyr  
 2930 2935 2940  
 Leu Val Leu Asn Ser Ser Asp Asp Asn Lys Gly Val Leu Ile Pro Pro  
 2945 2950 2955 2960  
 Arg Arg Arg His Leu Cys Thr Arg Pro Ile Thr Ala Tyr Asn Tyr Arg  
 2965 2970 2975  
 Lys Gly Asp Lys Glu Ile Leu Lys Lys Lys Leu Leu Thr Ser Ala Phe  
 2980 2985 2990  
 Ser Gln Gly Gln Leu Leu Gly Gln Lys Tyr Lys Ser Glu Glu Glu Leu  
 2995 3000 3005  
 Cys Phe Glu Ala Met Lys Tyr Ser Tyr Ala Asp Tyr Ser Asp Ile Ile  
 3010 3015 3020  
 Lys Gly Thr Asp Met Met Asp Thr Ser Leu Ser Glu Lys Ile Lys Lys  
 3025 3030 3035 3040  
 Ile Phe Glu Thr Ser Asn Glu Ala Thr Glu Asn Arg Lys Thr Trp Trp

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3045	3050	3055
Glu Asn Asn Arg Arg Gln Ile Trp His Ala Met Leu Cys Gly Tyr Lys		
3060	3065	3070
Ile Ala Thr Ser Lys Val Thr Leu Asp Glu Gly Trp Cys Gln Leu Pro		
3075	3080	3085
Lys Asp Glu Glu Thr Asn Gln Phe Leu Arg Trp Leu Ile Glu Trp Ala		
3090	3095	3100
Lys Gln Ala Cys Lys Glu Lys Lys His Val Ser Asp Ser Leu Lys Thr		
3105	3110	3115
Lys Cys Pro Arg Ser Asn Glu Asp Asn Phe Glu Ala Ser Glu Leu Leu		
3125	3130	3135
Arg Gln Pro Gly Cys Gln Asn Asp Ile Arg Lys Tyr Ile Ser Leu Asn		
3140	3145	3150
Ile Leu Ile Lys Asn Thr Met Glu Asn Leu Asn Ile Lys Tyr Lys Gln		
3155	3160	3165
Leu Lys Asp Gln Ser Ser Gly Asn Ile Asp Asn Lys Pro Ser Glu Glu		
3170	3175	3180
Asn Val Gln Ser Tyr Ile Lys Ser Lys Asp Ser Gln Cys Ala Leu Glu		
3185	3190	3195
Leu Asn Asp Ile Asn Glu Ile Val Thr Gly Thr Lys Asn Asn Glu Asn		
3205	3210	3215
Asn Glu Phe Lys Glu Val Leu Lys Lys Leu Tyr Pro Gly Leu Tyr Phe		
3220	3225	3230
Val Glu Asp Glu Thr His Lys Asn His Val Leu Asp Gly Asn Ile Lys		
3235	3240	3245
Glu Glu Glu Gln Thr Val Arg Pro Lys Ala Leu Tyr Phe Phe Thr Pro		
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His Val Asp Ser Phe Tyr Gln Ala Pro Leu Phe Ser Thr His Arg Val		
3265	3270	3275
Ala Gln Tyr Asp Pro Lys Asn Asp Ile Leu Lys Ser Ser Ile Ser Val		
3285	3290	3295
Val Ile Val Ser Ala Leu Gly Leu Ile Ala Leu His Phe Met Lys Lys		
3300	3305	3310
Lys Phe Lys Ser Ser Val Asp Leu Leu Arg Ile Leu Asn Ile Pro Gln		
3315	3320	3325
Gly Glu Tyr Gly Met Pro Thr Leu Glu Ser Lys Asn Arg Tyr Ile Pro		
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Tyr Arg Ser Gly Pro Tyr Lys Gly Lys Thr Tyr Ile Tyr Met Glu Gly		
3345	3350	3355
Asp Thr Ser Gly Asp Glu Asp Lys Tyr Met Trp Asp Leu Ser Ser Ser		
3365	3370	3375
Asp Ile Thr Ser Ser Glu Ser Glu Tyr Glu Glu Leu Asp Ile Asn Asp		
3380	3385	3390
Ile Tyr Val Pro Gly Ser Pro Lys Tyr Lys Thr Leu Ile Glu Val Val		
3395	3400	3405
Leu Glu Pro Ser Lys Arg Asp Ile Pro Ser Asp Asp Thr Pro Ser Asn		
3410	3415	3420
Asp Thr Pro Arg Thr Asn Arg Phe Ile Asp Asp Glu Trp Asn Glu Leu		
3425	3430	3435
Lys His Asp Phe Val Ser Gln Tyr Leu Pro Asn Thr Glu Pro Asn Asn		
3445	3450	3455
Asn Tyr Lys Ser Ala Asp Ile Pro Met Asn Thr Glu Pro Asn Thr Leu		
3460	3465	3470
Tyr Ser Asp Asn Pro Glu Glu Lys Pro Phe Ile Ile Ser Ile His Asp		
3475	3480	3485

Arg Asp Leu Tyr Thr Gly Lys Glu Ile Ser Tyr Asn Ile Asn Met Ser  
 3490 3495 3500  
 Thr Asn Thr Asn Asn Asp Ile Pro Met Asn Ala Arg Asn Asp Ser Tyr  
 3505 3510 3515 3520  
 Arg Gly Ile Asp Leu Ile Asn Asp Ser Leu Val Val Leu Asn Leu Leu  
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 Ile Tyr Met Met Lys Tyr  
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20 25 30

Gly Asn Glu Gly Val Cys Met Pro Pro Arg Arg Lys Ser Ile Cys Ile

35 40 45

His Asn Leu Thr Leu Glu Glu Gln Thr Lys Asn Lys Tyr Gln Leu Arg

50 55 60

Glu Ala Phe Ile Lys Cys Ala Ala Lys Glu Thr Asn Leu Leu Trp Asp

65 70 75 80

Lys Tyr Lys Asn Asp Lys Asn Glu Ala Glu Glu Leu Leu Lys Lys Gly

85 90 95

Lys Ile Pro Glu Asp Phe Met Arg Ile Met Phe Tyr Thr Phe Gly Asp

100 105 110

Phe Arg Asp Phe Cys Leu Glu Asn Asp Met Gly Lys Asp Val Asp Lys

115 120 125

Val Lys Lys Asn Ile Asn Lys Val Phe Asn Asn Ser Ser Lys Arg Gly

130 135 140

Phe Lys Lys Ile Asp Pro Glu Asn Trp Trp Asn Glu Asn Gly Pro Gln

145 150 155 160

Ile Trp Asn Gly Met Leu Cys Ala Leu Ile His Ala Asp Thr Lys Asp

165 170 175

Ser Ile Lys Asn Lys Asp Asn Tyr Lys Tyr Glu Lys Val Thr Ile Leu

180 185 190

Ala Lys Arg Asp Gly Ser Asn Gly Met Thr Leu Ser Glu Phe Ala Lys

195 200 205

Lys Pro Lys Phe Leu Arg Trp Phe Val Glu Trp Tyr Asp Asp Tyr Cys

210 215 220

Lys Glu Arg Gln Lys Tyr Leu Thr Glu Val Ala Ser Thr Cys Lys Ser

225 230 235 240

Ile Asp Gly Gly Gln Leu Lys Cys Asp Arg Gly Cys Asn Asn Lys Cys

245 250 255

Asp Glu Tyr Lys Lys Tyr Met Arg Lys Lys Lys Glu Glu Trp Asn Leu

260 265 270

Gln Asp Lys Tyr Tyr Lys Asp Lys Arg Glu Asn Lys Gly Ile Asp Lys

275 280 285

Gly Pro Ile Gly Ile Ile

290

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<213> Plasmodium falciparum

<400> 8

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Ile Asn Arg Glu Glu Gly Ser Cys Met Pro Pro Arg Arg Gln Lys Leu  
35 40 45  
Cys Ile His Asn Leu Glu His Leu Ser Glu Lys Ala Thr Glu Thr Glu  
50 55 60  
Leu Arg Lys Ala Phe Ile Glu Cys Ala Ala Ile Glu Thr Phe Trp Leu  
65 70 75 80  
Trp Asp Lys Tyr Lys Glu Asp Lys Lys Asp Glu Lys Lys Thr Glu Gly  
85 90 95  
Gly Gly Ile Ser Asp Asp Pro Asp Asp Pro Gln Lys Lys Leu Glu Gly  
100 105 110  
Gly Thr Ile Pro Glu Asp Phe Lys Arg Gln Met Phe Tyr Thr Tyr Gly  
115 120 125  
Asp Tyr Arg Asp Phe Leu Phe Gly Thr Asp Ile Ser Lys Gly His Gly  
130 135 140  
Lys Glu Ser Ala Leu Gly Lys Lys Ile Asp Ser Leu Phe Lys Asn Gly  
145 150 155 160  
Asp Gln Lys Ser Pro Ser Gly Lys Thr Pro Thr Glu Trp Trp Asn Asp  
165 170 175  
Tyr Gly Pro Asp Ile Trp Lys Gly Met Val Cys Gly Leu Ser His His  
180 185 190  
Ile Lys Asn Gly Asn Lys Glu Gln Leu Arg Lys Asn Leu Thr Asp Asn  
195 200 205  
Asn Lys Tyr Thr Lys Ile Ser Ser Lys Leu Glu Asp Phe Ala Ser Arg  
210 215 220  
Pro Gln Phe Leu Arg Trp Phe Ile Glu Trp Gly Asp Gln Phe Cys Arg  
225 230 235 240  
Glu Arg Val Val Lys Ile Asn Gln Leu Lys Thr Gly Cys Asn Glu Tyr  
245 250 255  
Glu Cys Gly Ser Gln Glu Asn Gly Lys Lys Glu Ala Cys Lys Asn Ala  
260 265 270  
Cys Glu Ala Tyr Lys Ser Trp Leu Lys Asp Trp Lys Asp Gln Tyr Glu  
275 280 285  
Gln Gln Thr Ala Lys Phe Asp Lys Asp Lys Lys Asp Lys Lys Phe Asp  
290 295 300  
Gly Thr Ser Ala Glu Val Asp Val Ala Ala Val Ser Ser Val His Glu  
305 310 315 320  
Tyr Leu Gln Glu Glu Leu Lys Asn Leu Cys Thr Lys Gly Asp Cys Ala  
325 330 335  
Cys Met Glu Lys Pro Ser Ala Gln Asp Glu Glu Thr Glu Leu Leu Gly  
340 345 350  
Gly Asn Tyr Phe Pro Glu Ala Met Asp Tyr Pro Pro Lys Glu Ile Gly  
355 360 365  
Glu Arg Cys Lys Cys Ala Ile Pro Ser Glu Pro Met Ser Cys Val Glu  
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Tyr Glu Ser Ser Leu Lys Gly  
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 Asn Thr Lys Leu Gly Glu Asp Glu Gly Val Cys Met Pro Pro Arg Arg  
 35 40 45  
 Gln Asn Leu Cys Val His Tyr Leu Thr Lys Leu Asn Asp Asp Ser Lys  
 50 55 60  
 Glu Glu Asp Leu Arg Glu Ala Phe Ile Lys Ser Ala Ala Ala Glu Thr  
 65 70 75 80  
 Phe Leu Leu Arg Gln Tyr Tyr Asn Ser Lys Asn Val Glu Asp Asp Lys  
 85 90 95  
 Ile Leu His Arg Asp Met Ile Pro Pro Glu Phe Phe Arg Ser Met Phe  
 100 105 110  
 Tyr Thr Phe Gly Asp Tyr Arg Asp Ile Cys Leu Asp Thr Asp Ile Ser  
 115 120 125  
 Glu Lys Ile Ala Asp His Asp Val Thr Thr Ala Lys Lys Lys Ile Thr  
 130 135 140  
 Ala Val Phe Gln Lys Ile Gly Ser Lys Thr Thr Asn Gly Lys Lys Val  
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 Leu Glu Arg Glu Gly Trp Trp Lys Glu Tyr Gly Leu Ser Ile Trp Lys  
 165 170 175  
 Gly Met Leu Cys Ala Leu Ser Tyr Asn Thr Glu Thr Lys Lys Met Asp  
 180 185 190  
 Glu Gly Val Arg Thr Tyr Leu Met Lys Tyr Ile Tyr Lys Asn Asn Asp  
 195 200 205  
 Ile Lys Glu Tyr Leu Glu Glu Phe Ala Ser Arg Pro Pro Phe Leu Arg  
 210 215 220  
 Trp Val Thr Glu Trp Gly Glu Asp Phe Val Lys Asn Arg Lys Lys Glu  
 225 230 235 240  
 Leu Val Ser Leu Lys Lys Lys Cys Asp Ser Cys Thr Leu Arg Asn Asn  
 245 250 255  
 Gly Thr Ser Asn Lys Thr Cys Asp Asp Asn Glu Asn Cys Gly Ala Cys  
 260 265 270  
 Lys Thr Gln Cys Glu Lys Tyr Lys Lys Trp Met Glu Arg Trp Lys Lys  
 275 280 285  
 His Tyr Ser Ser Gln Lys Lys Lys Phe Gln Leu Tyr Lys Asn Ser Ala  
 290 295 300  
 Thr Tyr Asn Asn Gly Leu Ala Val Lys Glu Ala Asn Ser Glu Thr Tyr  
 305 310 315 320  
 Lys Asn Asp Pro Glu Val Thr Glu Ala Asn Ser Ala Lys His Ala Arg  
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 <212> PRT  
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 Val Ser Pro Lys Val Ile Thr Ile Leu Glu Lys Glu Asn Asp Ala Lys  
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 Tyr Ala Ala Lys Gln Asn Ser Asn Asn Glu Leu Leu Asp Asp Trp Trp  
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 Asp Gln His Gly Lys Asp Ile Trp Glu Gly Met Leu Cys Ala Leu Thr  
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 His Lys Ile Ser Asp Glu Glu Lys Lys Lys Glu Ile Lys Asn Lys Tyr  
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 Ser Cys Ser Asp Ala Lys Asp Tyr Asp Gly Cys Lys Asn Thr Lys Ser  
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 Lys Lys Lys Val Glu Tyr Thr Lys Gln Lys Gly Lys Phe Asp Ala Glu  
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Tyr Pro Asp Trp Asp Cys Lys Lys Asn Ile Asp Asn Ser His Ser Gly  
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 Ala Cys Met Pro Pro Arg Arg Gln Lys Leu Cys Val Arg Asp Leu Thr  
 35 40 45  
 Gln Gly Gly Glu Ile Arg Lys Pro Glu Asp Ile Leu Thr Lys Phe Ile  
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 Asn Cys Ala Ala Lys Glu Thr His Phe Ala Trp His Lys Tyr Lys Lys  
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 Asp Asn Val Asn Ala Glu Asn Glu Leu Lys Ser Gly Lys Ile Pro Glu  
 85 90 95  
 Gly Phe Arg Lys Gln Met Tyr Tyr Thr Phe Gly Asp Phe Arg Asp Ile  
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 Phe Phe Gly Thr Asp Ile Ser Ser Cys Arg Tyr Ile Lys Asp Thr Ser  
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 Gln Thr Ile Lys Ser Lys Leu Gly Asp Gln Ala Thr Thr Glu Lys Gly  
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 Asp Thr His Ile Asp Asp Asn Lys Lys Leu Gln Glu Trp Trp Thr Ile  
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 His Gly Pro Lys Ile Trp Glu Gly Met Leu Cys Ala Leu Thr Asn Gly  
 165 170 175  
 Leu Ser Glu Ser Glu Lys Lys Asn Ile Leu Gln Asp Tyr Ser Tyr Asn  
 180 185 190  
 Lys Leu Asn Asn Ala Glu Lys Asp Asp Cys Cys Leu Glu Lys Phe Ala  
 195 200 205  
 Ser Lys Pro Gln Phe Leu Arg Trp Tyr Val Glu Trp Ser Asp Glu Phe  
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 Cys Arg Glu Arg Lys Lys Leu Glu Asp Lys Val Glu Asp Val Cys Ile  
 225 230 235 240  
 Lys Ala Lys Asp Tyr Glu Gly Cys Lys Asn Asn Lys Ser Asn Asn Ser  
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 Cys Val Lys Val Cys Lys Glu Tyr Glu Asn Tyr Ile Thr Gly Lys Lys  
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 Thr Gln Tyr Glu Ser Gln Glu Gly Lys Phe Asn Thr Glu Lys Arg Gln  
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 305